

Polarization Observables in Meson Photoproduction with the Crystal Ball/TAPS at MAMI

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A comparison of experimentally observed excited nucleon states to model predictions or lattice QCD calculations is made, large differences arise, specifically concerning the number of excited states. In order to fully understand the strong interaction in the non-perturbative region, the excitation spectrum of nucleons is an important tool to use. The electromagnetic coupling of photons to protons is different than that of neutrons in certain states. Several experimental facilities have dedicated programs to measure polarization observables in different photoproduction reactions including the Crystal Ball/TAPS setup at the MAMI accelerator in Mainz, Germany. A complete partial wave analysis (PWA) can assist in yielding more information about any reaction with polarization observables playing a crucial role. Spin observables are essential in disentangling the contributing resonant and non-resonant amplitudes, whereas cross-section data alone is not sufficient for separating resonances. Preliminary results of polarization observables (E , T , and F) of η , single, and double π production will be shown with comparison to predictions of recent multipole analyses. These results will allow for significantly increasing the world database on these reactions.

Author: WALFORD, Natalie

Presenter: WALFORD, Natalie

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